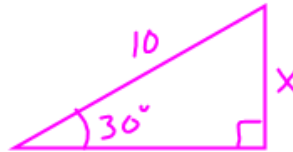


ToolKitconcept: Basic Trig ratiossect. 6.3Rule: $\sin \theta = \frac{\text{opp}}{\text{hyp}}$

$\cos \theta = \frac{\text{adj}}{\text{hyp}}$

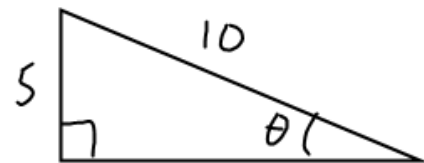
$\tan \theta = \frac{\text{opp}}{\text{adj}}$

To find side length:

$$\sin(30^\circ) = \frac{x}{10}$$

$$x = 10 \sin(30)$$

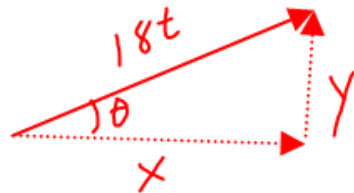
$$x = 5$$

To find Angle:

$$\sin \theta = \frac{5}{10}, \quad \theta = \sin^{-1}\left(\frac{5}{10}\right)$$

$$\theta = 30^\circ$$

Any Motion can be broken into horz. + vertical components.



$$x = 18t \cos \theta \quad y = 18t \sin \theta$$

Hints:

→ make sure you are in degree mode.

→ Only for right triangles (for now)

ToolkitConcepts: Parametric ShapesSection 6.4Rule:

$$\begin{aligned} x &= r \cos(t^\circ) \\ y &= r \sin(t^\circ) \end{aligned} > \text{gives a circle}$$

Basic setup

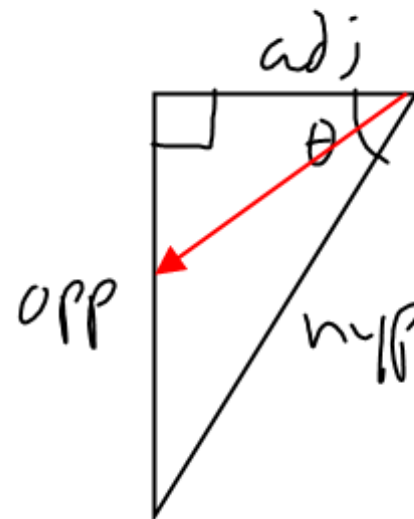
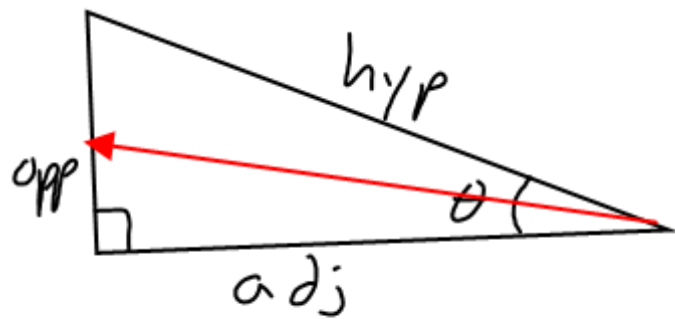
$$t_{\text{-min}} = 0$$

$$t_{\text{-max}} = 360$$

$$t_{\text{-step}} = 1-5$$

- $t_{\text{-min}}$ controls first pt plotted
- $t_{\text{-max}}$ controls # of rotations (360=1, 720=2) - may need to adjust by adding $t_{\text{-min}}$ if $t_{\text{-min}} \neq 0$
- $t_{\text{-step}}$ controls # of pts plotted, $360 \div \# \text{sides}$
- r controls radius
- add to x to shift r+/left
- add to y to shift up/down
- add inside w/ t to rotate,

$$\begin{aligned} x &= 3 \cos(t + 45) \\ y &= 3 \sin(t + 45) \end{aligned} > \text{rotates } 45^\circ$$



Example 1

② Ez's
Boat River

$$x = 4t$$

$$y = 0$$

$$x = 0$$

$$y = 3t$$

$$r = \frac{d}{t}$$

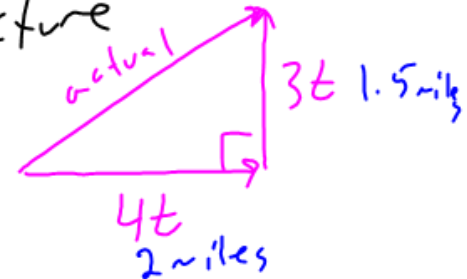
$$t = \frac{d}{r}$$

$$d = rt$$

③ time

$$\frac{2}{4} = \frac{1}{2} \text{ hr}$$

① Picture



Total

$$x = 4t + 0$$

$$y = 0 + 3t$$

$$x = 4t$$

$$y = 3t$$

↓ ↓ ↓
 dist rate time

$$y = 3\left(\frac{1}{2}\right)$$

$$y = 1.5 \text{ miles}$$

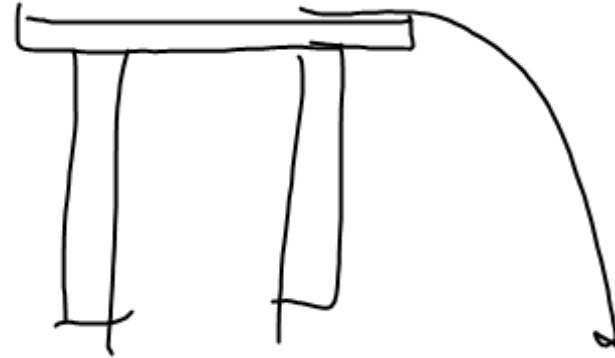
$$\sqrt{2^2 + 1.5^2} = 2.5 \text{ total dist traveled}$$

$$\tan \theta = \frac{1.5}{2}$$

$$\theta = \tan^{-1}\left(\frac{1.5}{2}\right)$$

$$\theta = 36.87^\circ$$

$$y = \underbrace{-16t^2}_{\text{gravity}} + \underbrace{s_0}_{\text{initial height}}$$



picture

HW

6.5 #1-9

$$\begin{aligned} x &= 1.5t \\ y &= -16t^2 + 2.75 \\ 0 &= -16t^2 + 2.75 \end{aligned} \quad \text{equations}$$

0 when it hits
the ground \rightarrow solve
for t